

WHAT IS CLAIMED IS:

1 1. An apparatus for processing substrates, comprising:
2 an atmospheric coating system;
3 a first transfer chamber disposed in said atmospheric coating system;
4 a first substrate handling member disposed in said first transfer chamber;
5 a cure system in communication with said first transfer chamber;
6 a second transfer chamber disposed in said cure system;
7 a second substrate handling member disposed in said second transfer
8 chamber;
9 a loadlock chamber in communication with said second transfer
10 chamber;
11 a cap system in communication with said loadlock chamber;
12 a third transfer chamber disposed in said cap system; and
13 a third substrate handling system disposed in said third transfer chamber.

1 2. The apparatus of claim 1 wherein said atmospheric coating
2 system comprises:
3 one or more substrate coating modules in communication with said first
4 transfer chamber; and
5 one or more substrate bake modules in communication with said first
6 transfer chamber.

1 3. The apparatus of claim 2 wherein said substrate coating module
2 comprises a spin-on deposition module.

1 4. The apparatus of claim 2 further comprising one or more
2 substrate cooling modules in communication with said first transfer chamber.

1 5. The apparatus of claim 1 wherein said cure system comprises
2 one or more cure chambers in communication with said second transfer chamber.

1 6. The apparatus of claim 5 wherein said cure chamber is in fluid
2 communication with a vacuum pump.

1 7. The apparatus of claim 5 wherein said cure chamber comprises
2 an electron beam radiation source.

1 8. The apparatus of claim 5 wherein said cure chamber is in fluid
2 communication with a gas distribution system configured to deliver process gases from
3 one or more gas sources.

1 9. The apparatus of claim 1 wherein said cure system further
2 comprises a vacuum pump in fluid communication with said second transfer chamber.

1 10. The apparatus of claim 1 further comprising a vacuum pump in
2 fluid communication with said loadlock chamber.

1 11. The apparatus of claim 1 wherein said cap system comprises:
2 one or more processing chambers, each one of said processing chamber
3 defining at least one isolated processing region therein, wherein each processing region
4 is connected with said third transfer chamber.

1 12. The apparatus of claim 11 wherein a vacuum pump is in fluid
2 communication with said one or more processing chambers.

1 13. The apparatus of claim 11 wherein said processing region
2 includes a gas distribution assembly disposed therein and each gas distribution
3 assembly receives process gases from one or more gas sources.

1 14. The apparatus of claim 11 further comprising a plasma system
2 having a RF generator connected with each processing region.

1 15. The apparatus of claim 1 wherein while a substrate is being
2 processed in said apparatus, said substrate is unexposed to an environment that is
3 external to said apparatus.

1 16. The apparatus of claim 1 wherein said coat system, said cure
2 system and said cap system are not in fluid communication with an environment
3 external to said apparatus while a substrate is being processed in said apparatus, so as to
4 prevent the exposure of said substrate to an environment external to said apparatus.

1 17. The apparatus of claim 1 wherein while a substrate is being
2 processed in said cure system and said cap system, said substrate's temperature remains
3 approximately above 100°C, thus preventing the condensation of moisture on said
4 substrate.

1 18. The apparatus of claim 1 wherein while a substrate is transferred
2 by said second substrate handler from said cure system to said cap system, said
3 substrate's temperature remains above approximately 100°C, thus preventing the
4 condensation of moisture on said substrate.

1 19. The apparatus of claim 1 wherein while a substrate is transferred
2 by said second substrate handler from said cure system to said cap system, said
3 substrate is not exposed to an environment external to said apparatus.

1 20. The apparatus of claim 1 wherein while a substrate is transferred
2 by said second substrate handler from said cure system to said cap system, said
3 substrate's temperature remains above approximately 100°C, thus preventing the
4 condensation of moisture on said substrate, and said substrate is not exposed to an
5 environment external to said apparatus.

1 21. An apparatus for processing substrates, comprising:
2 an atmospheric coating system;
3 a first transfer chamber disposed in said atmospheric coating system;
4 a first substrate handling member disposed in said first transfer chamber;
5 a cure system in communication with said first transfer chamber;
6 a second transfer chamber disposed in said cure system; and
7 a second substrate handling member disposed in said second transfer
8 chamber.

1 22. The apparatus of claim 21 wherein said atmospheric coating
2 system comprises:
3 one or more substrate coating modules in communication with said first
4 transfer chamber; and
5 one or more substrate bake modules in communication with said first
6 transfer chamber.

1 23. The apparatus of claim 22 wherein said substrate coating module
2 comprises a spin-on deposition module.

1 24. The apparatus of claim 22 further comprising one or more
2 substrate cooling modules in communication with said first transfer chamber.

1 25. The apparatus of claim 21 wherein said cure system comprises
2 one or more cure chambers in communication with said second transfer chamber.

1 26. The apparatus of claim 25 wherein said cure chamber is in fluid
2 communication with a vacuum pump.

1 27. The apparatus of claim 25 wherein said cure chamber comprises
2 an electron beam radiation source.

1 28. The apparatus of claim 25 wherein said cure chamber is in fluid
2 communication with a gas distribution system configured to deliver process gases from
3 one or more gas sources.

1 29. The apparatus of claim 21 wherein said cure system further
2 comprises a vacuum pump in fluid communication with said second transfer chamber.

1 30. The apparatus of claim 21 wherein while a substrate is being
2 processed in said apparatus, said substrate is unexposed to an environment that is
3 external to said apparatus.

1 31. The apparatus of claim 21 wherein said coat system and said
2 cure system are not in fluid communication with an environment external to said
3 apparatus while a substrate is being processed in said apparatus, so as to prevent the
4 exposure of said substrate to an environment external to said apparatus.

1 32. An apparatus for processing substrates, comprising:
2 a cure system;
3 a cure system transfer chamber disposed in said cure system;
4 a cure system substrate handling member disposed in said cure system
5 transfer chamber;

6 a loadlock chamber in communication with said cure system transfer
7 chamber;
8 a cap system in communication with said loadlock chamber;
9 a cap system transfer chamber disposed in said cap system; and
10 a cap system substrate handling member disposed in said cap system
11 transfer chamber.

1 33. The apparatus of claim 32 wherein said cure system comprises
2 one or more cure chambers in communication with said cure system transfer chamber.

1 34. The apparatus of claim 33 wherein said cure chamber is in fluid
2 communication with a vacuum pump.

1 35. The apparatus of claim 33 wherein said cure chamber comprises
2 an electron beam radiation source.

1 36. The apparatus of claim 33 wherein said cure chamber is in fluid
2 communication with a gas distribution system configured to deliver process gases from
3 one or more gas sources.

1 37. The apparatus of claim 32 wherein said cure system further
2 comprises a vacuum pump in fluid communication with said cure system transfer
3 chamber.

1 38. The apparatus of claim 32 further comprising a vacuum pump in
2 fluid communication with said loadlock chamber.

1 39. The apparatus of claim 32 wherein said cap system comprises:
2 one or more processing chambers, each one of said processing chamber
3 defining at least one isolated processing region therein, wherein each processing region
4 is connected with said cap system transfer chamber.

1 40. The apparatus of claim 39 wherein a vacuum pump is in fluid
2 communication with said one or more processing chambers.

1 41. The apparatus of claim 39 wherein said processing region
2 includes a gas distribution assembly disposed therein and each gas distribution
3 assembly receives process gases from one or more gas sources.

1 42. The apparatus of claim 39 further comprising a plasma system
2 having a RF generator connected with each processing region.

1 43. The apparatus of claim 32 wherein while a substrate is being
2 processed in said apparatus, said substrate is unexposed to an environment that is
3 external to said apparatus.

1 44. The apparatus of claim 32 wherein said cure system and said cap
2 system are not in fluid communication with an environment external to said apparatus
3 while a substrate is being processed in said apparatus, to prevent the exposure of said
4 substrate to an environment external to said apparatus.

1 45. The apparatus of claim 32 wherein while a substrate is being
2 processed in said cure system and said cap system, said substrate's temperature remains
3 approximately above 100 °C, thus preventing the condensation of moisture on said
4 substrate.

1 46. The apparatus of claim 32 wherein while a substrate is
2 transferred by said cure system substrate handler from said cure system to said cap
3 system, said substrate's temperature remains above approximately 100°C, thus
4 preventing the condensation of moisture on said substrate.

1 47. The apparatus of claim 32 wherein while a substrate is
2 transferred by said cure system substrate handler from said cure system to said cap
3 system, said substrate is not exposed to an environment external to said apparatus.

1 48. The apparatus of claim 32 wherein while a substrate is
2 transferred by said cure system substrate handler from said cure system to said cap
3 system, said substrate's temperature remains above approximately 100°C, thus
4 preventing the condensation of moisture on said substrate, and said substrate is not
5 exposed to an environment external to said apparatus.

1 49. An apparatus for processing substrates, comprising:
2 an atmospheric coating system;
3 a coating system transfer chamber disposed in said atmospheric coating
4 system;
5 a coating system substrate handling member disposed in said first
6 transfer chamber;
7 a loadlock chamber in communication with said coating system transfer
8 chamber;
9 a cap system in communication with said loadlock chamber;
10 a cap system transfer chamber disposed in said cap system; and
11 a cap system substrate handling system disposed in said cap system
12 transfer chamber.

1 50. The apparatus of claim 49 wherein said atmospheric coating
2 system comprises:
3 one or more substrate coating modules in communication with said first
4 transfer chamber; and
5 one or more substrate bake modules in communication with said first
6 transfer chamber.

1 51. The apparatus of claim 50 wherein said substrate coating module
2 comprises a spin-on deposition module.

1 52. The apparatus of claim 50 further comprising one or more
2 substrate cooling modules in communication with said first transfer chamber.

1 53. The apparatus of claim 49 further comprising a vacuum pump in
2 fluid communication with said loadlock chamber.

1 54. The apparatus of claim 49 wherein said cap system comprises:
2 one or more processing chambers, each one of said processing chamber
3 defining at least one isolated processing region therein, wherein each processing region
4 is connected with said third transfer chamber.

1 55. The apparatus of claim 54 wherein a vacuum pump is in fluid
2 communication with said one or more processing chambers.

1 56. The apparatus of claim 54 wherein said processing region
2 includes a gas distribution assembly disposed therein and each gas distribution
3 assembly receives process gases from one or more gas sources.

1 57. The apparatus of claim 54 further comprising a plasma system
2 having a RF generator connected with each processing region.

1 58. The apparatus of claim 49 wherein while a substrate is being
2 processed in said apparatus, said substrate is unexposed to an environment that is
3 external to said apparatus.

1 59. The apparatus of claim 49 wherein said coat system and said cap
2 system are not in fluid communication with an environment external to said apparatus
3 while a substrate is being processed in said apparatus, to prevent the exposure of said
4 substrate to an environment external to said apparatus.

1 60. The apparatus of claim 49 wherein while a substrate is
2 transferred from said coat system to said cap system, said substrate is not exposed to an
3 environment external to said apparatus.